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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WANG, CHUN CHENG

ART UNIT

PAPER NUMBER

4171

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,004	Applicant(s) SUGIO ET AL.	
	Examiner Chun-Cheng Wang	Art Unit 4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/07/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: Claim contains 'a clay base...' that should change to 'a clay based' Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayuki et al. (JP2001-062934) in view of Neumann (US 4201308).

Regarding to claim 1: Applicants recite a puncture sealing agent comprising at least: a rubber latex solution; a short fiber; and a clay base viscosity improver, wherein the viscosity of the rubber latex solution after addition of the clay base viscosity improver thereto from 3 to 6000 mPa.s in the range of +50 to -20°C.

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Takayuki et al. disclose a flat tire repairing agent showing reliable can-stability and excellent flat tire repairing performance by adding vinylon short fibers to a blend of natural rubber latex and synthetic rubber latex (Abstract). Ethylene glycol, for low temperature flow mobility, and resorcinol formalin resin, for promoting solidification, can be used in the repairing agent [0011]. Takayuki et al. does not suggest a clay base(d) viscosity improver.

5. Regarding to claim 2: Applicants further recite the content of a solid component is 5 to 70 mass percent and the content of the short fiber is 0.1 to 5 mass percent.

Takayuki et al. disclose the content ratio of the vinylon short fibers is 1-15 pts.wt. to 100 pts.wt. aqueous solution. The aqueous solution contains 40-70 wt.% solid content (Abstract).

6. Regarding to claims 3-4: Applicants further recite a length (L) and a diameter (D) of the short fiber, respectively, are in the ranges below: Length (L): $0.05 \leq L \leq 10$ mm and Diameter (D): $1 \leq D \leq 100$ μ m (claim 3) and a ratio (L/D) of a length (L) to a diameter (D) of the short fiber is in the range of $5 \leq L/D \leq 2000$ (Claim 4).

Takayuki et al. disclose the vinylon short fibers are preferably of such characteristics that the diameter is 50-100 μ m; the length is 1-5 mm, i.e. length/diameter range 10-00, (Abstract).

7. Takayuki et al. teach the limitations in claims 1-4 other than clay base(d) viscosity improver, wherein the viscosity of the rubber latex solution after addition of the clay base viscosity improver thereto from 3 to 6000 mPa.s in the range of +50 to -20^o C (instant claim 1).

8. Neumann discloses a settable, stable, thixotropic, aqueous or water-based sealant compositions essentially consist of synthetic acrylonitrile-butadiene copolymer latexes, thixotropic, mineral flow control agent, water-washed kaolin clay (column 9, lines 8-10), and water (column 4, lines 42-51); and when taken from an appropriately sealed storage container or used, should have a Brookfield viscosity in the vicinity of about 2,800 to 12,000 cps at 70 degree F. (column 4, lines 63-68 and column 5, line 1). The kaolin clay particles provides **effective means for controlling the flow characteristics of the water-based sealant**, thereby provides a

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thixotropic sealant having sufficient thickness, body or viscosity to stay in place and not sag or slump (i.e., resistance to sag or anti-sag) during setting (column 8, lines 24-29).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to include water-washed kaolin clay as flow control agent in the same field of sealant application to optimize the viscosity of the puncture sealing agent performance.

9. Claims 5, 7-10 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayuki et al. (JP2001-062934) and Neumann (US 4201308) as applied to claims 1-4 in view of Dugan (US2002/0110686 A1).

10. Regarding to claims 5, and 9-10: Applicants further recite the short fiber is obtained by compositing an inorganic filler with a material that is lower in specific gravity than the rubber latex solution (claim 5), the short fiber is obtained by compositing an inorganic filler with a material that is lower in specific gravity than the rubber latex solution (claim 9); the short fiber is obtained by compositing an inorganic filler with a material that is lower in specific gravity than the rubber latex solution (claim 10).

Takayuki et al. and Neumann are silent on the fibers in the instant claims.

11. Regarding to claim 8: Applicants further recite the short fiber has a multi-layered structure and the outermost layer thereof is made of a material higher in specific gravity than the rubber latex solution.

Takayuki et al. and Neumann are silent on using the fibers in the instant claim.

12. Regarding to claims 7 and 13-14: Applicants further recite the short fiber is obtained by compositing a material lower in specific gravity than the rubber latex solution and a material higher in specific gravity than the rubber latex solution (claim 7); and the short fiber is obtained by compositing a material lower in specific gravity than the rubber latex solution and a material higher in specific gravity than the rubber latex solution (claim 13) and the short fiber is obtained by compositing a material lower in specific gravity than the rubber latex solution and a material higher in specific gravity than the rubber latex solution (claim 14).

Takayuki et al. are silent on the fibers in the instant claims.

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13. Dugan disclose fibers formed of a polymeric nanocomposite material. Nanocomposite materials generally include a polymer having nanosized inorganic platelet particles dispersed [0007], the fillers used in the production of polymeric articles include titanium oxide (TiO₂), kaolin, pigments, carbon black, and the like [0004], and the resultant fibers can exhibit enhanced strength, e.g., tensile yield strength and flexural modulus, as compared with fibers which are free of the nanocomposite material, or which contain conventional powdered fillers such as unexfoliated clay, silica or carbon black, and can also exhibit improved stiffness and heat resistance [0010]. The nanocomposite material could have intercalated structure, in which a single extended polymer chain is inserted between layers resulting in a well ordered multilayer with alternating polymer/inorganic layers [0021]. The polymer resin forming the nanocomposite matrix can be any of the types of polymer resins known in the art capable of being formed into a fiber construction. Suitable polymers useful in the practice include polyolefins, including polypropylene, polyethylene, polybutene, and polymethyl pentene (PMP), polyamides, including nylon 6, polyesters, including polyethylene terephthalate, polyethylene naphthalate, polytrimethylene terephthalate, poly(1,4-cyclohexylene dimethylene terephthalate) (PCT), and aliphatic polyesters such as polylactic acid (PLA), polyphenylene sulfide, thermoplastic elastomers, polyacrylonitrile, acetals, fluoropolymers, co- and ter-polymers thereof and mixtures thereof [0022]. The fibers can also exhibit **improved stiffness and heat resistance, and decreased moisture absorption, flammability, and permeability**, as compared to fibers prepared without filler and/or with conventional fillers [0010].

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to use fibers having nanosized

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inorganic platelet particles, i.e. higher specific gravity material, dispersed in polyethylene, lower specific gravity material, for desired property improvements.

14. Claims 6 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayuki et al. (JP2001-062934) and Neumann (US 4201308) in view of McInnes (US2002/0077391 A1).

15. Regarding to claims 6 and 11-12 : Applicants further recite the short fiber is made of a porous material that is higher in specific gravity than the rubber latex solution (claim 6); the short fiber is made of a porous material that is higher in specific gravity than the rubber latex solution (claim 11); and the short fiber is made of a porous material that is higher in specific gravity than the rubber latex solution (claim 12)

Takayuki et al. and Neumann are silent on the ceramic fibers in the claimed but teach that fibers may be used.

McInnes discloses a tire sealant composition and fibers for use in tire sealant compositions include ceramic fibers composed mainly of alumina and silica, which is could be a porous fiber has a specific gravity higher than rubber latex solution, polyethylene fibers and cellulosic fibers. The sealant is of the type to be injected into pneumatic tires to seal future punctures (abstract). Ceramic materials have **strong mechanical strength, heat resistance and very stable**. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to use ceramic fibers in place of the polymeric fibers used.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Cheng Wang whose telephone number is (571)270-5459. The examiner can normally be reached on Monday to Friday w/alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 4171

Chun-Cheng Wang
Examiner, Art Unit 4171

/ccw/